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WILDLIFE REVIEW

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SPECIAL NOTICE

This is the last issue of WILDLIFE REVIEW to be compiled by W. L. McAtee, who retires from the Federal Service September 30, 1947, after 43½ years employment in the Biological Survey and the Fish and Wildlife Service. The number of abstracts in the 51 numbers of WILDLIFE REVIEW prepared almost exclusively by McAtee is 6,053.

The new address to which all exchanges, articles for abstracting, and other communications should be sent is:

WILDLIFE REVIEW,
Patuxent Research Refuge,
Laurel, Maryland.

Until further announcement, the Review will be conducted by Neil Hotchkiss, Biologist.

Chicago, Ill. No. 51 September, 1947

Conservation: Dove, Mourning

Atherton, Guy. Protection of mourning doves, The Flicker (Miss S. C. Holmberg, 4827 Woodlawn Blvd., Minneapolis 6, Minn.), 19 (2), June 1947, pp. 47-49.

Account of passage of a bill enabling Minnesota to join "twenty-one other progressive states and the Dominion of Canada in the protection of mourning doves."

Conservation: In management

Errington, Paul L. A question of values, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 267-272.

A well-written statement of personal philosophy, as to the spiritual rewards of trapping and hunting, recalled when the bags have been forgotten. Use of the results of research in wildlife management is discussed. Two practices especially objected to are "cleaning up" or "doctoring" areas that should be left alone, and overemphasis on "vermin" control. "Writing as a hunter," he states, "I would say that sport purchased at disproportionate costs to other outdoor values is not worth having." Other quotations: "I regard hunting logically justifiable only in so far as it may be done without real detriment to both game and non-game species, which means in short that the hunting toll (bagged and lost) of a given species be pretty well confined to biological surpluses." "The issue is not one of management versus no management, but rather of what management should be and where it should be done; the criteria of accomplishment may be conformity to good taste as well as statistical impressiveness."

Conservation: Waterfowl

Hochbaum, H. Albert. Where are the ducks?, Audubon Magazine (1000 Fifth Ave., New York 28, N. Y. 45 cents a copy), 49(4), July-Aug. 1947, pp. 211-213, 2 photos.

In the basin of Lake Manitoba, severe declines in the number of breeding ducks were noted both in 1946 and 1947. There is a great deal of underpopulated habitat, much of it of the finest kind. The observational basis for these statements is summarized and the author concludes: "There is little more to say at this time. An important portion of the duck breeding grounds is seriously underpopulated this spring of 1947. What bearing this may have on the overall waterfowl situation, we cannot say. But clearly in the Lake Manitoba basin, and in much of the adjacent terrain, the ducks are slipping fast away."

Conservation: Waterfowl

Taylor, Walter P. The duck situation in Texas, Texas Game and Fish (Walton Bldg., Austin, Tex. 10 cents a copy), 5(3), Feb. 1947, pp. 4-5, 18-20, 4 photos.

Wildlife features of the Southeastern States are reviewed and the importance of this area as a wintering ground for wild fowl is emphasized. The variety and originally great numbers of the waterfowl are stated and the present decline discussed. Measures to remedy the situation are considered, including the establishment of additional refuges in the wintering zone.

Control: Aquatic weeds

Eicher, George. Aniline dye in aquatic weed control, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 193-197, 1 pl.

Experiments with the method are described as well as large-scale tests of the most promising dyes. This means of weed control may be too expensive for general use but further study seems warranted. Author's summary: "(1) Aniline dye has been tried in Arizona as an inhibiting agent for aquatic plants through exclusion of light; (2) out of several dyestuffs tested, nigrosine was found to be cheapest and most permanent; (3) by experiment it was found that darkening of ponds caused lowering of the bottom temperature and a temporary increase in plankton; (4) dye was applied to two lakes at the rate of 10 pounds per acre, which was found to be insufficient. More was later added to one of the lakes; (5) the best method of application was found to be dumping of the dye in shallow water at points. Dispersal was complete in a 200-acre lake in less than 24 hours; (6) greatest effect of the dye was noted the following year when normally semi-emergent weeds failed to reach the surface; (7) the method needs more experimentation in waters of more cloudy and cooler regions."

Control: Crayfish

Davison, Verne E. What to do about crayfish, Soil Conservation (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 13(2), Sept. 1947, pp. 27-29, 2 photos, 2 cartoons.

Agricultural damage by these crustaceans in some localities is serious. Notes on methods of control, including a new one--exposing baits of cotton seed treated with a 2½ percent solution of DDT. Other bases may be used and the cost is less than for replanting.

Control: Effects of DDT

Erickson, Arnold B. Effects of DDT mosquito larviciding on wildlife. Part II. Effects of routine airplane larviciding on bird and mammal populations, U. S. Public Health Reports (Supt. of Documents, Washington 25, D.C. 10 cents a copy), 62(35), Aug. 29, 1947, pp. 1254-1262, 4 figs., 2 tables.

Author's summary: "(1) Weekly airplane applications of DDT were made over a 17-week period on 815 acres of the Savannah River Refuge, South Carolina; the DDT was in the form of a 20 percent solution in a highly methylated naphthalene and was applied at a rate of 0.1 pound per acre per treatment; (2) the number of pairs of breeding birds on the 51.7 acres of sprayed and 30.8 acres of unsprayed islands and dykes showed no significant difference between the

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areas. DDT had no apparent effect on the birds of the sprayed area; (3) the numbers of singing males heard by weeks from March 15 to August 7, on sprayed and unsprayed areas, increased in both areas at the beginning of the nesting season, fluctuated mildly during the season, and then dropped off at the end of the season. The absence of a sudden drop or a general gradual decline in the population of the sprayed area indicates that the DDT had no harmful effects; (4) the fluctuations of birds on both sprayed and unsprayed areas were similar and apparently DDT had no measurable effect on the population from week to week; (5) DDT had no detected effect on the cotton rat or house-mouse population of the sprayed area; (6) daily sight observations were made on cottontail rabbits, cotton rats, and raccoons on sprayed and unsprayed areas from May 13 to August 30 while driving through the areas. Calculated on a weekly basis, the fluctuations in the number of observations on the two areas roughly paralleled one another, indicating that DDT had no effect on the mammals of the sprayed area."

Control: Rodent, methods

Ward, Justus C. Certain new techniques in rodent control, Pests and Their Control (1200 Oak St., Kansas City, Mo.), 15(2), March 1947, pp. 12-14.

Major advances during the war period were the development of ANTU and 1080. The toxicity of these compounds, the ways in which they may be used for rodent control, and precautions in handling them are described. When all facts about them are considered, it must be admitted that standardized red squill remains the only poison that is reasonably safe for use by the public. As yet there is no effective antidote for either ANTU or 1080. Recent knowledge of other poisons, fumigants, and building processes for rat control also is set forth.

Control: Rodent, methods

Ward, Justus C., and Donald A. Spencer, Wartime improvements in rodent control agents, Food Technology (Institute of Food Technology, Geneva, N. Y.), 1, 1947, pp. 51-55.

Stories of the development of ANTU and 1080 and of tests of their effectiveness in the laboratory and the field by numerous agencies and in many countries. The computed comparative toxicities to man of several rodent baits are tabulated. Dangers to domestic animals are considered. Precautions to prevent poisoning of human beings and methods of use against rodents are described.

Control: 1080, lethal doses

Ward, Justus C., and D. A. Spencer. Notes on the pharmacology of sodium fluoracetate--Compound 1080, Journ. Amer. Pharmaceutical Assoc. (Easton, Pa, 35 cents a copy), Sc. Edit. 36(2), Feb. 1947, pp. 59-62, tables.

An extensive table shows the results of experimentation as to lethal doses of this chemical for numerous species of mammals and birds; a summary of results obtained at the Edgewood Arsenal also is quoted. The degree of toxicity varied considerably for different species and even for the sexes of ducks. Primates are relatively resistant but the toxicity is so high as to justify the warning that this compound must be handled with extraordinary caution. Bibliography of 13 titles.

Destruction: Osprey

Kenyon, Karl W. Breeding populations of the osprey in Lower California, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(4), July-Aug. 1947, pp. 152-158, 2 figs.

Author's summary: "The Osprey population along the north coast of Lower California has fallen markedly in the past thirty to forty years. San Martin Island is a notable instance: In 1913 about thirty pairs nested there whereas in 1946 the nesting population consisted of three pairs. This appears to be generally true except for the colonies at Scammon's Lagoon. For this area no specific past records were found in the literature. On one small island in Scammon's Lagoon the population appears to have been 'cleaned out' by coyotes within the last few years. The Osprey lays few eggs, usually only two or three, and has a very long period of vulnerability while it is nesting. Because of these facts the nesting Osprey is likely to suffer greatly if its enemies are present during the breeding season. The presence of men in the Osprey's nesting area does not necessarily mean that the area becomes useless to the Osprey. However, in the area studied man appears to be the most important enemy of the Osprey. Evidences for this statement are as follows: (1) Bullets were dug from a rock near a nest. (2) Fishermen were observed target-practicing at Ospreys and their nests. (3) Fishermen who needed food used the Osprey eggs in cooking and ate some of the Osprey 'squabs.'"

"The most devastating type of persecution is, however, that which the Ospreys suffer at the hands of commercial fishermen, mostly Americans." Bibliography of 14 titles.

Diseases and Parasites: Newcastle disease

Levine, P. P., Julius Fabricant, and Grayson B. Mitchell. Newcastle disease in ring-necked pheasants, Cornell Veterinarian (P. P. Levine, Cornell University, Ithaca, N. Y. 75 cents a copy), 37(3), July 1947, pp. 265-267, 1 pl.

Outbreak on a combined poultry and game-bird farm. Emergency slaughter was instituted at once upon detection of the disease but it was estimated that otherwise mortality would have exceeded 50 percent of the entire flock. Symptoms, identification, pictures of affected birds. "The implications of Newcastle disease in pheasants are far-reaching. Some of the birds in this outbreak were to have been liberated two days after symptoms appeared. Spread of this infection to domestic fowls on range and to pheasants in the wild could have taken place easily. The possibility of transmission of Newcastle disease to pheasant chicks by hens used as foster mothers is also not to be overlooked."

Diseases and Parasites: Rabies

Corwin, E. H. L., and Lois Stice. Control of rabies. Report by the Committee on Public Health Relations of the New York Academy of Medicine. U. S. Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 62(34), Aug. 22, 1947, pp. 1215-1237, 1 table.

The full report is on file at the New York Academy of Medicine. This abridgement discusses the incidence of rabies by animal groups in the United States, around 9,000 cases a year (35-50 in people); wild animals are grouped as miscellaneous but are stated to include numerous foxes. Research on the disease, state control measures, legislative authority, and enforcement agencies are dealt with. When incidence is treated by states, it shows that the disease was most prevalent during 1945 in Louisiana, Texas, Pennsylvania, Ohio, Georgia, New York, and California. In this section, rats, rabbits, squirrels, opossums, "civet cats", foxes, and coyotes are listed as victims. The most serious epizootic was among foxes in Georgia and Alabama. Preventive vaccination is now feasible both for humans and animals and should rapidly be increased. Rabies control in practice is discussed for Maryland, New York, and Massachusetts. Diagnosis, methods of vaccination, and serum prophylaxis in man are treated and recommendations made for rabies control. Bibliography of 30 titles. This important and valuable article includes appendices on "Types of Legislation for Control of Rabies, 1945" and a list of enforcement agencies and officers.

Diseases and Parasites: Rabies in foxes

Rietz, J. H. Rabies in the fox, Journ. Amer. Veterinary Med. Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 111(845), Aug. 1947, pp. 138-139.

Notes on the behavior, and upon autopsies, of 13 red and gray foxes killed in West Virginia. The foxes were fearless and showed a tendency to attack, which the author concludes are almost certain indications of their being affected by rabies.

Diseases and Parasites: Typhus

Hill, Elmer L., and Samuel C. Ingraham II. A study of murine typhus fever in Coffee County, Alabama, U. S. Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 62(24), June 13, 1947, pp. 875-881, 9 tables.

Description of the area, prevalence of the disease, rodent reservoir studies, and rodent ectoparasites (3 species of fleas, 4 of mites). Infection of rats with typhus was directly proportional to their infestation with Xenopsylla cheopis.

Diseases and Parasites: Acanthocephala, Mediorhynchus

Van Cleave, Harley J. The acanthocephalan genus Mediorhynchus, its history and a review of the species occurring in the United States, Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(4), Aug. 1947, pp. 297-315, 1 pl., 1 fig.

In their adult state, members of this genus occur exclusively in the intestines of land birds; in the course of the article, several of these are definitely named. The origin and history of the generic concept are discussed as is the occurrence and recognition of the species found in the United States. There is a key to three species followed by descriptions and illustrations. Bibliography of 32 titles.

Diseases and Parasites: Acanthocephala, Moniliformis

Chandler, Asa C. Notes on Moniliformis clarki in North American squirrels, Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(3), June 1947, pp. 278-281, 1 table.

Author's summary: "Study of specimens of Moniliformis clarki from gray squirrels, fox squirrels, and flying squirrels at Welaka, Fla., supports the view that this is a valid species, distinguished from M. dubius of rats by the smaller sizes of the proboscis, proboscis sac, and eggs, although the body size may be as great or greater. An additional point of difference is the longer and more slender lemnisci. M. spirodentatis McLeod, 1933, is believed to be a synonym of M. clarki."

Diseases and Parasites: Acarina, Ixodes

Smith, Carroll N., and Harry K. Gouck. Ixodes bishoppi, a new species from Georgia (Acarina: Ixodidae), Annals Entomological Soc. America (Arthur J. Lindsey, Granville, Ohio), 40(1), March 1947, pp. 75-81, 2 pls.

Description, measurements, illustrations; from both bird and mammal hosts, Georgia.

Diseases and Parasites: Acarina, Myonyssus

Ewing, H. E., and Edward W. Baker. Myonyssus jamesoni, a new liponyssid mite (Acarina: Laelaptidae) from Blarina brevicauda (Say), Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(4), Aug. 1947, pp. 376-379, 1 pl.

Taxonomic record of the genus and two previously described species; key to three species of which that indicated in the reference is described as new from northeastern localities; measurements, illustrations.

Diseases and Parasites: Acarina, Trombicula

Wharton, G. W. Studies on North American chiggers. I. The "akamushi" group, Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(3), June 1947, pp. 260-264, 1 fig.

Redescription of Trombicula myotis a parasite of bats; discussion of significance of the akamushi group in disease transmission. Bibliography of 10 titles.

Diseases and Parasites: Acarina, Trombiculidae

Brennan, James M. New species of chiggers (Acarina, Trombiculidae) from bats of the nearctic region, Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(3), June 1947, pp. 245-252, 4 figs.

The terminology and standard measurements used are defined and four new species of genera Trombicula, Hannemania, and Euschöngastia from bats of the United States are described and illustrated.

Diseases and Parasites: Acarina, Trombiculidae

Wharton, G. W. Studies on North American chiggers. 2. The subfamilies and Womersia strandtmani n.g., n.sp., Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(4), Aug. 1947, pp. 380-384, 1 fig.

Definition of the family Trombiculidae on the basis of larval morphology; diagnoses and key to 4 subfamilies; description of a new genus and species from a brown pelican taken in Texas; measurements, illustrations, comparative notes.

Diseases and Parasites: Anoplura, Hoplopleura

Pritchard, A. Earl. Hoplopleura oenomydis Ferris, a louse found on domestic rats in the United States, Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(4), Aug. 1947, pp. 374-375.

A widely distributed parasite of Rattus species now recorded from R. norvegicus taken in Florida and several other states.

Diseases and Parasites: Cestoda, Andrya

Rausch, Robert. Andrya sciuri n.sp., a cestode from the northern flying squirrel, Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(4), Aug. 1947, pp. 316-318, 2 figs.

From Wisconsin; description, measurements, illustrations, comparative notes; key to 4 North American species; bibliography of 6 titles.

Diseases and Parasites: Cestoda, "Diphyllobothrium"

Wardle, Robert A., James A. McLeod, and Ileen E. Stewart. Lühe's "Diphyllobothrium" (Cestoda), Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(4), Aug. 1947, pp. 319-330, 2 pls.

Groups of this complex are discussed and a key presented to the seven genera into which it may now be divided, one of which, Cordicephalus, from seals and sea lions is described as new; genotype phocarus Fabricius 1780. Hosts and distribution of numerous species are indicated. Two-page bibliography.

Diseases and Parasites: Diptera, Ornithoica

Bartlett, L. M. Hippoboscid parasite from screech owl, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(3), July 1947, pp. 456-457.

Ornithoica vicina, Massachusetts; notes on hosts of this species and O. confluenta.

Diseases and Parasites: Helminths of rabbits

Erickson, Arnold B. Helminth parasites of rabbits of the genus Sylvilagus, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlire Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 255-263, 1 table.

The literature (57 titles cited) is reviewed and Minnesota investigations are summarized. One species of trematode, 6 of cestodes, and 9 of nematodes, recovered from 97 cottontails, are listed in a table and the number and percentage of infested specimens recorded. Reports of helminths from 6 species of Sylvilagus are summarized with references to the literature, and keys embracing all of these parasites are presented.

Diseases and Parasites: Mallophaga, Lagopoecus

Hopkins, G. H. Stray notes on Mallophaga--VII, Annals and Magazine of Nat. Hist. (Wm. Dawson & Sons, Ltd., 102 Wigmore St., W. 1, London, England), Ser. 11, No. 99, March 1946, pp. 170-183, 3 figs., 1 table.

Lagopoecus gibsoni n.sp. from the sage grouse, Saskatchewan and Wyoming, is described and illustrated (pp. 172-176).

Diseases and Parasites: Nematoda, Uncinaria

Baylis, H. A. A redescription of Uncinaria lucasi Stiles, a hookworm of seals, Parasitology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 18 shillings six pence a copy), 38(3), July 1947, pp. 160-162, 6 figs.

From the Alaskan fur-seal (Callorhinus alascanus); description, measurements, illustrations, comparative notes.

Diseases and Parasites: Protozoa, Trichomonas

Stabler, Robert M. Trichomonas gallinae, pathogenic trichomonad of birds, Journ. Parasitology (R. M. Stabler, Colorado College, Colorado Springs, Colo.), 33(3), June 1947, pp. 207-213, 1 fig.

In the course of discussing the morphology, hosts, pathology, epidemiology, and treatment, a number of affected wild birds are named; the bibliography covers nearly 2 pages.

Diseases and Parasites: Siphonaptera

Jellison, Wm. L. Siphonaptera: Host distribution of the genus Opisocrostis Jordan, Trans. Amer. Microscopical Soc. (Frank E. Eggleton, Dept. of Zoology, University of Michigan, Ann Arbor. $1.00 a copy), 66(1), Jan. 1947, pp. 64-69, 1 map., 1 pl.

Species assigned to the genus and their type hosts are listed, their distribution discussed, and diagnostic characters of 8 species and subspecies are illustrated. Author's summary: "Fleas of the genus Opisocrostis are characteristic parasites of fossorial sciurid rodents of the genera Citellus and Cynomys in North America only. The genus Citellus and several genera of fleas that are characteristic parasites of Citellus are found in both Asia and North America. The genus Cynomys is found only in North America. The nine described species and subspecies of Opisocrostis can be divided into three basic groups. One species of each group is a characteristic parasite of Cynomys. All other species which represent modifications of the three types are parasites of Citellus. It appears that the genus Opisocrostis was originally parasitic only on Cynomys but later spread to Citellus with the differentiation of new forms but that it has not yet reached the geographic limits of Citellus in North America and has not spread to Citellus in Asia." Bibliography of 7 titles.

Diseases and Parasites: Of birds

Beaudette, F. P. Common mosquito borne diseases of birds, Proc. Thirty-third Ann. Meeting N. J. Mosquito Extermination Assoc. (New Brunswick, N. J.), pp. 31-33, 1946 (1947).

Notes drawn from the literature (17 titles cited) on both captive and wild birds relating to: bird pox, equine encephalomyelitis, bird malaria, and leukemia.

Ecology: Bird nests

Preston, F. W., and R. T. Norris. Nesting heights of breeding birds, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 28(3), July 1947, pp. 241-273, 10 figs., 11 tables.

Discussion of birds as creatures of the air and of the ground, description of study areas (in Pennsylvania), account of the breeding bird population, nest count, tabulation of the nests according to height, and mathematical treatment of the findings. Authors' summary: "The density of bird population, or at least of their nests, lumping all species together, is greatest at ground level in examples of typical woodland and bush-grown countryside, and falls off rapidly with height. This is probably true of many other, perhaps most, environments, and of the world as a whole. The law of increasing scarcity with increasing height is roughly exponential. Severe 'disturbance,' using that term to mean 'perpetual alarms,' can drive the birds off the ground, and this happens in suburban areas, owing to disturbance by humans and domestic animals. In the wild, there appears to be a tendency to return to earth, as shown by a number of examples; and in a complete absence of disturbance, a large part, perhaps all, the bird population might return to earth, and in a mild climate even become flightless. A tentative formula for the incidence of 'disturbance' and its variation with height is proposed, and the consequent nesting-distribution, calculated for one or two suburban examples, is given and compared with observed results." Bibliography of 21 titles.

Ecology: Home ranges

Stickel, William H., and James B. Cope. The home ranges and wanderings of snakes, Copeia (M. Graham Netting, Carnegie Museum, Pittsburgh 13, Pa. $1.00 a copy), 1947(2), June 1947, pp. 127-136, 1 table.

Review of pertinent literature; notes on methods of study and discussion of results. Comparisons are made of the findings of other investigators for various groups of animals including factors that bring about alterations in home ranges and in movements. Bibliography of 36 titles.

Ecology: Prairie rabbits

Brown, H. Leo. Coaction of jack rabbit, cottontail, and vegetation in a mixed prairie, Trans. Kansas Acad. Sci. (Robert W. Taft, University of Kansas, Lawrence), 50(1), 1947, pp. 28-44, 11 photos, 6 tables.

Author's summary: "The utilization and dissemination of native plants by the jack rabbit and cottontail on a mixed prairie near Hays, Kansas, were studied. If recently deposited fecal pellets were found near plants partly eaten it was considered that these plants were utilized by the animal that deposited the pellets. The jack rabbit was found to utilize a total of 34 species of plants. Even the cottontail secured food from 31 species but several were of non-important woody plants such as smooth sumac, ill-scented sumac, chokecherry, and prairie rose. Jack rabbits were most abundant on the grazed areas. This was perhaps due to the succulent herbage for food, the short turf for a quick escape, and the scattered bunches of vegetation to furnish protection. The cottontail preferred areas with a thick growth of the taller grasses and societies of weeds and shrubs accompanied with rocks and burrows for protection. A close correlation was found between the number of pellets and the abundance of jack rabbits and cottontails frequenting an area. A count of .54 jack rabbit pellets per square foot represented approximately one jack rabbit per acre

and .5 pellets per square foot indicated about one cottontail to an acre. Seeds of several species of plants were taken from pellets of the jack rabbit and the cottontail. Germination tests showed that many of the seeds were viable and that passing through the digestive tracts of rabbits increased the germination of some of the seeds. This was especially true of buffalo grass, cactus, and smooth sumac whereas sand dropseed was affected but very little. The jack rabbit was more important than the cottontail in disseminating seeds in pellets. Approximately 12.75 pounds of seed of the sand dropseed were deposited in jack rabbit pellets on an acre in the natural revegetation type. This is considerably more than is recommended for reseeding abandoned cultivated fields. It seems reasonable to assume from the preceding data that jack rabbits and cottontails are of considerable assistance in introducing seeds of prairie plants into abandoned cultivated fields and range land denuded by drought or overgrazing." Bibliography of 18 titles.

Ecology: Winter birds

Quay, T. L. Winter birds of upland plant communities, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of Interior, Washington 25, D. C. $1.00 a copy), 64(3), July 1947, pp. 382-388, 3 tables.

Author's summary and conclusions: "(1) A study was made of the relative abundance of the winter birds occurring in each stage of the upland plant succession in the vicinity of Raleigh, North Caroline; (2) forty plots totaling 680 acres were used, divided among 7 stages. Seventy-five censuses were taken, between November 1, 1939, and March 1, 1940. Some relative figures are given on birds-per-acre; (3) forty-two species were recorded. The birds of each stage were listed according to abundance and frequency. Only a few species (19%) were of high abundance. From 75% to 85% of the species exhibited a range of only one or two habitats; (4) four basic plant habitats are indicated on the basis of their associated bird populations. These are, with their predominant birds: Bare Field--Meadowlark; Crab Grass--Savannah Sparrow; Old Field--Field Sparrow, Junco; Woods--Golden-crowned Kinglet, Ruby-crowned Kinglet, Pine Warbler, Chickadee."

Education: Field leadership

Brooks, Maurice. The field trip and the leader, Audubon Magazine (1000 Fifth Ave., New York 28, N. Y. 45 cents a copy), 49(4), July-Aug. 1947, pp. 231-238.

Suggestions to those who may be called upon to lead field parties, under the following headings: "The leader of a field trip need not be an encyclopedia of the outdoors", "Every field trip should have a definite, attainable objective", "A field trip is not primarily a 'hike'", "The leader must create a classroom situation outdoors", "Names of living things are not enough", "The leader must discover the level of his group, and teach at that level", "The field trip should train people to use all their senses", and "Every field trip should teach some principles of conservation". "Conservation is dynamic. Properly presented, it kindles enthusiasm and unites its followers in a common cause. In the field, it supplements formal instruction by adding an action

program. Not only does the student learn of the outdoors; he is also given the constructive impulse to protect and preserve it. Thus, does faith become works. This is the final test of a good field trip. If the leader is able to bring to life and individuality the plants and animals about which he teaches, it must follow that his students will look upon them as important links in the chain that is the community. Once our people have seen this light, they will be the more ready to join in keeping America's soils fertile, her streams sparkling, her forests green, and her wildlife abundant."

Education: Waterfowl management

Beard, Elizabeth B., and Warren W. Chase. Teaching aids in wildlife management. Outline of Waterfowl Management. The Overbeck Co., Publishers (1216 University Ave., Ann Arbor, Mich. $1.25 a copy), 28 pp., processed, 1947.

Subdivisions of the subject, reading references, questions, and projects are suggested, bearing on: Classification and anatomy of the waterfowl, life history, restoration, management, and waterfowl as a source of sport.

Education: Wildlife management

Chase, Warren W., and Elizabeth B. Beard. Teaching aids in wildlife management. Outline of the principles of Wildlife Management. The Overbeck Co., Publishers (1216 University Ave., Ann Arbor, Mich. $1.75 a copy), 61 pp., processed, 1947.

Analysis of wildlife management: The idea, raw materials, environment, tools, range, food, cover, census methods, measurement of productivity, control measures, land use, harvest, predation, other limiting factors, and administration. Each section includes a set of questions for study and ample bibliographic references.

Food Habits: Birds vs. blossoms

Brackbill, Hervey. Birds eating blossoms, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 59(2), June 1947, p. 114.

Observations in Maryland and some notes from the literature.

Food Habits: Birds vs. fir seeds

Adams, Lowell. Food habits of three common Oregon birds in relation to reforestation, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 281-282, 1 table.

Choice by Oregon junco, white-crowned sparrow, and spotted towhee, among constituents of rodent bait and feeding station menu, having some bearing on taste of these species for Douglas fir seed.

Food Habits: Birds vs. flatheaded borer

West, A. S., Jr. The California flatheaded borer (Melanophila californica Van Dyke) in ponderosa pine stands of northeastern California, Canadian Journ. Research (National Research Council, Ottawa, Canada), 25(3), June 1947, Section D, pp. 97-118, 17 figs., 5 tables.

Review of literature, status of the insect in commercial stands of ponderosa and Jeffrey pines, and account of its life history. "Woodpeckers, chiefly the arctic three-toed woodpecker (Picoides arcticus), commonly destroy a considerable proportion of the overwintering prepupal larvae. In 1938 a count on infested bark taken from standing trees showed 23% of the original overwintering prepupal brood had been destroyed by woodpeckers."

Food Habits: Birds vs. Japanese beetle

Brackbill, Hervey. Birds that eat Japanese beetles, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(3), July 1947, pp. 458-459.

Notes from literature and record of personal observations in Maryland.

Food Habits: Utilization of elderberries

Chapman, Floyd C. The elderberries in wildlife conservation, Ohio Conservation Bul. (1106 State Office Bldg., Columbus 15, Ohio. 10 cents a copy), 11(7), Aug. 1947, pp. 20-21, 2 photos.

Description of both wild and cultivated species and their value as food and cover for wildlife. Abstract of a publication "Elderberry culture in Ohio". The number of species of birds known to feed upon elderberries exceeds 100.

Food Habits: Blackbird, Yellow-headed

Knowlton, G. F. Some insect food of the yellow-headed blackbird, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(3), July 1947, p. 459.

Summary of the food found in 15 stomachs collected in Utah.

Food Habits: Of fox, red

McKean, William T. Foxes, dens, and farmers, North Dakota Outdoors (211 South 4th St., Grand Forks, N. D. 5 cents a copy), 10(2), Aug. 1947, p. 22.

Den hunting for bounties may not be an altogether useful pursuit. Summary of findings from analyses of 593 droppings collected at 12 North Dakota dens in 1945. Of these scats, 488 contained remains of mice, 66 of rabbits, and 17 of ground squirrels, 158 of game birds, 4 of poultry, 14 of songbirds, and 9 of carrion.

Food Habits: Of martin, purple

Riggs, Carl D. Purple martins feeding on emerging may-flies, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 59(2), June 1947, pp. 113-114.

Picking them from the surface of the water. Indiana.

Food Habits: Of owls

Fitch, Henry S. Predation by owls in the Sierran foothills of California, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(4), July-Aug. 1947, pp. 137-151, 1 pl., 1 fig., 9 tables.

Ecology of the study area where food habits of the horned and barn owls were investigated mainly by pellet analyses. The food items identified are tabulated and discussed, seasonal trends are indicated, and weight of prey is estimated. The results are considered as a whole and the chief findings are summarized. From author's summary: "The Barn Owl is so scarce in relation to its principal prey species, the gopher, that it is unlikely that the gopher is appreciably affected. Even the combined effect of all predators seems insufficient to eliminate a substantial part of the gopher's annual increase in view of its numbers and reproductive potential. Predation by Horned Owls would eliminate annually, for each acre of land, a rodent of woodrat to rabbit size, or its equivalent; more than half the prey (by bulk) is comprised by the cottontail, somewhat less than one-fifth by the woodrat. Nearly all the prey animals taken are of kinds either principally harmful or largely neutral in their economic bearings. For the Horned Owl an exception is the California Quail, which, however, made up less than one per cent of the food sample, and its populations probably would not be appreciably affected." Bibliography of 9 titles.

Life Histories: Badger

Bradt, G. W. Badger--Living steam shovel, Michigan Conservation (Michigan Dept. of Conservation, State Office Bldg., Lansing 13), 16(6), July 1947, p. 4, 1 pl.

Appearance, distribution, occurrence in Michigan, food habits, fighting ability, economic value.

Life Histories: Bobwhite

Buss, Irven O., Helmer Mattison, and Frank M. Kozlik. The bobwhite quail in Dunn County, Wisconsin, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison 2), 12(7), July 1947, pp. 6-13, 1 pl., 2 figs., tables.

Information gleaned from a trapping study on sex and age ratios, weight, population turnover, and movements. The relation of pheasants, foxes, and quail also are considered. Authors' summary: "The sexes of 910 bobwhite quail trapped during six winters on a 9,900-acre study area in central Dunn County,

Wisconsin, showed that 56 per cent were males. This distorted sex ratio is similar to ratios reported by Stoddard and Leopold, who found from 53 to 58 per cent males in Georgia, Florida, and Missouri bobwhites. Of 593 quail aged in 1945-46 and 1946-47, 83 per cent were immature. Adult quail from Wisconsin and Missouri showed 63 and 62 per cent cocks respectively. The weights of 845 bobwhites trapped in Dunn County, Wisconsin, from 1940-41 to 1946-47, averaged 203 grams. The lightest weighed 150 grams, and the heaviest 256 grams. Adult quail averaged 3 to 8 grams heavier than immatures of the same sex, and adult hens averaged 4 grams heavier than adult cocks. Immature cocks and hens averaged one gram difference in weight. Turnover studies showed a high mortality rate to adult quail following the winter trapping period, and preceding the summer hatching time. If any inversity occurred on the Dunn County area, it was insignificant compared to the occurrence of sex distortion and high turnover during spring. Plotting the movements of quail banded in 1945-46, and trapped the following winter, showed bobwhites shifting up to three miles from one winter to the next. A two-year study of pheasants, fox, and quail living on the Dunn County study area, showed that fox were not responsible for the current pheasant decline. This conclusion is substantiated by the uniform decline of pheasants throughout Wisconsin wherein fox densities varied widely, and the simultaneous slump in Pelee Island pheasants where no fox are to be found." Bibliography of 11 titles.

Life Histories: Bobwhite

Tuttle, H. J. The bobwhite quail, Virginia Wildlife (Commission of Game and Inland Fisheries, Richmond 13, Va. 10 cents a copy), 8(8), Aug. 1947, pp. 14-15, 21, 3 photos.

Popular account of the life history and factors limiting the quail population. Of these, deficiencies in food and cover are most important.

The message of the last sentence is also that of an article by a quail hunter in the same publication: "A sportsman views the Virginia quail problem", by H. Minor Davis (pp. 8-9, 21-22, 2 photos).

Life Histories: Cats, Wild

Bradt, G. W. Lynx and bobcat, Michigan Conservation (Michigan Department of Conservation, Lansing 13), 16(8), Sept. 1947, pp. 4-5, illus.

Distinctions between these animals in appearance and habits; economic status in Michigan.

Life Histories: Cottontail

Beule, John D. Pennsylvania's cottontail problem, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 18(2), May 1947, pp. 10-13, 34-37, 11 photos, 12 tables.

A table records releases of cottontails, 1915-45, which do not seem to have affected hunter success one way or the other. Stocking appears to be "of value only where populations have been seriously depleted." Cottontail produc-

tion is a function of the environment and can be increased only by environmental improvement. Food and water requirements, calculated from experimental results, are approximately 60 pounds, and 40 quarts, respectively, per annum. Within ordinary limits, temperatures had little effect on food consumption; ability to withstand starvation was in proportion to age and size. The preferred summer foods of wild cottontails in Pennsylvania are listed; most of them are introduced or cultivated plants. Herbs are used whenever available but in winter, bark consumption is often resorted to; the kinds taken are listed in three groups according to their palatability to the rabbits. Greater bulk, perhaps twice as much, of bark is needed than of green food to maintain weight. Winter feeding is deemed impractical. The value of different types of cover is discussed. Burrows and brushpiles seemed of most importance. Mortality of young in summer may be due to cover deficiency--a problem worthy of serious study. Life history topics treated include: nest preparation, number of litters (average 4) and of young per litter (5), causes of nestling and juvenile mortality, and sex ratio (even).

Life Histories: Cottontail

Fitch, Henry S. Ecology of a cottontail rabbit (Sylvilagus auduboni) population in central California, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 33(3), July 1947, pp. 159-184, 6 figs., 8 tables.

The methods of the study and seasonal bait acceptance as revealed by live-trapping are discussed. Results are presented under the headings of: movements, population, feeding, weights, reproduction, natural enemies, and disease. There is a summary and bibliography of 12 titles. Much useful information is presented; the treatment of predation seems rather top-heavy.

Life Histories: Deer, White-tailed

Manville, Richard H. The Huron Mountain deer herd, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 263-266, 1 table.

Notes on the region, history of deer there, and report on investigations 1940-41 as to numbers, food supply, limiting factors (including kill), and average dressed weight of bucks (158 lbs., hunters' estimates).

Life Histories: Eagle, Bald

Williams, Ralph B., and Clyde P. Matteson, Jr. Wyoming hawks, Southern bald eagle, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 11(6), June 1947, pp. 9-12, 3 illustrations.

Description, distribution, nesting, food habits, protection.

Life Histories: Eagle, Golden

Williams, Ralph B., and Clyde P. Matteson, Jr. Wyoming hawks, Golden eagle, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 11(7), May 1947, pp. 16-19, 34-39, 4 photos.

Range, prevalence in Wyoming, description, nesting site, nests, eggs, development of young, food (jack rabbits, cottontails, marmots, ground squirrels, prairie dogs); instances of predation on larger animals are fully discussed. The authors believe that "golden eagles do not play important roles in the preservation of the bighorn and other game mammals and should be removed from the Wyoming predators list."

Life Histories: Hawk, Marsh

Williams, Ralph B., and Clyde P. Matteson, Jr. Wyoming hawks. The marsh hawk, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 11(7), July 1947, pp. 16-19, 37, 39, 5 photos.

Range, abundance in Wyoming, description, illustrations, habits, food, economic importance, longevity. It does about as much harm as good and may "be controlled or protected as the situation demands". "The prairie and meadows would seem destitute and lifeless were not the buoyant and graceful, blending form of the marsh hawk silhouetted against the grassy slopes of Wyoming".

Life Histories: Moose

Brown, Robert C., and James R. Simon. Notes on wintering moose, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 11(6), June 1947, pp. 4-8, 38, 6 photos.

Reaction to winter feeding; natural food; relations with elk and men.

Life Histories: Mustelids

Bradt, G. W. Wolverine, marten, fisher, Michigan Conservation (Michigan Dept. of Conservation, State Office Bldg., Lansing 13), 16(7), Aug. 1947, p. 4, 1 pl.

Brief popular accounts of the appearance, names, habits, food, and fur values of these animals.

Life Histories: Otter, Sea

East, Ben. The sea beaver is coming back, Animal Kingdom (Zoological Park, Bronx Park, New York 60, N. Y. 50 cents a copy), 50(4), Aug. 1947, pp. 124-129, 4 photos.

Popular account dealing with early exploitation and decline, protection and recovery, and briefly with food and other habits.

Life Histories: Prairie dogs

Scheffer, Theo H. Ecological comparisons of the plains prairie-dog and the Zuni species, Trans. Kansas Acad. Sci. (Robert W. Taft, University of Kansas, Lawrence), 49(4), 1947, pp. 401-406, 4 photos.

The Zuni species has a recognizably different call, does not make as prominent mounds nor clear its habitations of tall herbage as does the plains animal. Comment is made on communal life and economic value of both forms, and data are given on reproduction, sex ratio, weights, and measurements of Cynomys gunnisoni zuniensis. The author though long engaged in control work is no exterminationist. "May we close," he says, "with the expressed desire and expectancy that naturalists and nature lovers of tomorrow be not deprived entirely of pleasing contacts with these social little animals of our plains and mountain parks. There has been too much of the extermination thought in the background of organized means of repression, for the benefit of farmers and stockmen who very often are true conservationists themselves and would be the first to miss these denizens of the short-grass. Man's primaeval claim to dominate all animal life did not contemplate the destruction of a race, nor should his modern and more civilized claim assert new and revised sanctions. And yet we have seen the slogan 'Get the last dog' in the state by a certain zero hour. All creatures of the wild have had, or still have a certain value to us in the niche they fill. It goes without least argument that these niches must be narrowed as we encroach upon them with our essential occupations of life; but there always has been, always will be space for the survival of the lowly."

Life Histories: Squirrel, Gray

Ingles, Lloyd G. Ecology and life history of the California gray squirrel, California Fish and Game (Ferry Pldg., San Francisco 11, Calif.), 33(3), July 1947, pp. 139-158, 7 figs., 3 tables.

The area and methods of the study are set forth and the results stated as to activity and behavior of the animals, their relation to plants, competitors, predators, parasites and diseases, food, breeding, nests, young, home range, territory, populations, economic status, and suggestions for habitat improvement. Welcome information on a neglected animal.

Management: Beaver

Phelps, Chester F. The beaver, Virginia Wildlife (Commission of Game and Inland Fisheries, Richmond 13, Va. 10 cents a copy), pp. 5-6, 20, 1 photo.

Popular account of history, range, habits, food, and economic value. "At present the Game Commission is making a state-wide survey to accurately locate and chart all beaver colonies and the present populations and to select locations for new colonies. Surplus animals will be live-trapped from existing colonies and moved to other areas, providing the nucleus for selected restocking sites. While the beaver may never be as numerous as in pioneer days, there is no reason why the intelligent management of this industrious and valuable fur bearer cannot result in a substantial increase in the number of animals within our boundaries."

Management: Bird boxes

Gullion, Gordon W. Use of artificial nesting sites by violet-green and tree swallows, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(3), July 1947, pp. 411-415.

Author's summary: "The use of artificial nesting sites in the humid Transition Zone of western Oregon by Violet-green Swallows, Tachycineta thalassina lepida, and Tree Swallows, Iridoprocne bicolor, was studied over a period of four summers (1939 to 1942). Twenty-three nesting boxes in various sites in close proximity were used. Tree Swallows begin nesting sooner after arrival in the breeding area than the Violet-greens but are not as persistent. Both species frequently rear two broods a season. Pairs of both species require a certain amount of living space and will not tolerate intruders into their area. This is an interspecific requirement. Most pairs do not use the same nesting site or locality in succeeding seasons. Young birds do not seem to return to their natal homes. The use of artificial nesting sites is highly successful for both species (80-85%). Most nestling deaths are caused by invertebrate parasites (directly or indirectly) and predacious vertebrate marauders. (The use of DDT might eliminate the former.)"

Management: Brambles for wildlife

Chapman, Floyd B. What brambles mean to wildlife, Ohio Conservation Bul. (1106 State Office Bldg., Columbus 15, Ohio. 10 cents a copy), 11(7), July 1947, pp. 20-21, 2 photos.

Their value for erosion control, and for cover and food for wildlife. Notes on the Ohio species which should be encouraged where there is no serious conflict with agriculture. Mowing and burning increase the density of stands.

Management: Harvest

Allen, Durward L. Hunting as a limitation to Michigan pheasant populations, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 232-243, 2 figs., 7 tables.

Author's summary: "Hunting records have been analyzed for two areas of Michigan farmland totalling nearly 10,000 acres. Seven years of hunting at the Rose Lake Wildlife Experiment Station in Clinton County and nine years at the Prairie Farm in Saginaw County indicate that, within wide limits, there is little danger of overshooting the ringnecked pheasant. Both areas have good escape cover. The hunting season is 22 days, extending from October 15 to November 5. The daily bag limit is two cocks. Hunting pressures on the study areas have varied from 99 to 256 gun-hours per hundred acres. A Survey in 1940 showed that most private farms are hunted from 40 to 60 gun-hours per hundred acres. On the study areas the pheasant crop has depended upon the breeding season production as governed by spring weather more than any other factor. Shooting has not depleted the male birds nor has it had any discernible adverse effect. At Rose Lake in an average year at least 25 per cent of

the cocks can be expected to escape even the heaviest hunting. Hunting trends have been consistent for most years. Approximately 50 per cent of the hunting is done the first week, 30 per cent the second, and 20 per cent the last eight days. About 70 per cent of the pheasant kill can be expected the first week, 20 per cent the second and 10 per cent the last eight days. Thus shortening the season by as much as a third would be expected to preserve only about 10 per cent of the present season kill. At Rose Lake the first 100 to 125 gun-hours (per hundred acres) harvests the bulk of the pheasant crop, and hunting beyond that point is largely unrewarded. Large bird populations attract heavy hunting pressure and insure the harvesting of more cocks when the population is high. Low pheasant numbers mean discouraged hunters and lower gun pressure. In this state there is no need for refuges to preserve cocks from shooting or for the restocking of cocks as breeders." Bibliography of 20 titles.

While the findings of this author doubtless are correct for the species he has studied--cottontail, fox squirrel, and pheasant--conclusions as to the relative innocuousness of the gun should not be extended to other species except as warranted by investigation. Certainly bobwhites, which find adequate cover on the average farm, have been locally extirpated by hunting. Loss of cover has been a factor in reduction of range of the wild turkey, but by and large this bird has been shot away, and existing remnants are in constant danger of the same fate. Species that have been seriously reduced by their hunting as upland game include the golden and upland plovers, and that have been exterminated, the Eskimo curlew, passenger pigeon, and Carolina paroquet. Guns are for no other purpose than destruction and their effects should always be carefully watched and reasonably restricted.

Management: Inventory

Aldrich, John W. Counting the birds, Audubon Magazine (1000 Fifth Ave., New York 28, N. Y. 45 cents a copy), 49(4), July-Aug. 1947, pp. 214-220, 5 photos, 2 graphs.

An instance of counting to determine the effect of DDT spraying of woodland upon birds. Methods and values of bird counting and suggestions for extension of the practice. "It cannot be too strongly stated that we must have reliable data on bird populations under all sorts of conditions--natural as well as man-made, before we can hope to manage wildlife with a maximum of satisfaction. One of the chief obstacles to a more rapid expansion of this vital work by the various agencies responsible for the administration of our wildlife resources, is lack of properly trained personnel to conduct investigations of this sort. However, more and more attention is being given by universities to teaching students the fundamental biological concepts and techniques necessary for this type of work, and it seems likely that expansion of the program of bird census work will continue to accelerate until it has reached a magnitude in proportion to its importance in wildlife research."

Management: Inventory, pheasants

Fisher, Harvey I., Robert W. Hiatt, and William Bergeson. The validity of the roadside census as applied to pheasants, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp.205-226, 11 figs., 5 tables.

Advantages and use of this type of census are reviewed and its inconsistencies are discussed. The authors then report on their studies in Montana, describing the area and methods, presenting and analyzing the census data, and considering factors affecting them. They found great variation in results and note that even frequent censuses fail to produce reliable indices to pheasant populations. The usual single census is undependable and making enough counts to obtain reliable figures appears to be too expensive to be practicable. Bibliography of 6 titles.

Management: Inventory, waterfowl

Zimmerman, F. R. The 1946 fall flight of waterfowl through Wisconsin, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison 2), 12(7), July 1947, pp. 3-5, 2 photos.

Waterfowl have greatly declined in a period when the number of hunters increased threefold. Analysis of Wisconsin reports indicated the poorest flight in years, though food and cover conditions were excellent. Details are given regarding selected species and a table shows increase, decrease, or no change for 23 species in comparison with the 1945 fall flight.

Management: Marten

Twining, Howard, and Arthur Hensley. The status of pine martens in California, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 33(3), July 1947, pp. 133-137, 1 map, 1 table.

The range of the two subspecies occurring in the State is mapped; the habitat and numbers of the martens and the trapping toll are discussed. Authors' summary: "(1) The pine marten is found in the higher mountains of California; its valuable fur encourages trappers to seek it in the remote country where it lives; (2) people interested in the welfare of fur bearers have made two recommendations for management of marten: (a) that the marten season be closed in California, (b) that the season be closed early in order to protect the females which they believed are caught in greater numbers in January and February; (3) results of an examination of trapping records of past years plus a series of 41 interviews with marten trappers indicated that the marten population except in the north coast portion has not suffered serious depletion in California. A state-wide closed season is not recommended; (4) information from questionnaires shows that males in the catch outnumber females in every month of the season. The mating season for marten is in July and August. Noticeable embryo development does not start until after February. Early closing of the season for pine marten is not recommended; (5) a shrinking of the original range of the Humboldt

pine marten of the Coast Ranges in northwestern California was indicated and reports of catch suggested depletion of the marten population in this area; (6) upon the recommendation of this project the Fish and Game Commission in 1946 closed the season on pine marten in . . . . Del Norte, Humboldt, Siskiyou, and Trinity Counties."

Management: Pheasant

Leedy, Daniel L., and William B. Hendershot. The ring-necked pheasant and its management in Ohio. Ohio Division of Conservation (State Office Bldg., Columbus) Wildlife Conservation Bul. 1, 16 pp., 22 figs., 1 map, col. cover cut, 1947.

This pamphlet deals with the introduction and establishment of pheasants in Ohio, artificial propagation, regions of the State in relation to their suitability for the birds, habitat, nesting, brood sizes, and hunting pressure and other limiting factors. The fundamental principles of management are discussed, and 22 specific suggestions are made, each illustrated by a cartoon by Robert Hines. Report on a Cooperative Wildlife Research Project.

Management: Seed storage, eelgrass

Addy, C. E. Germination of eelgrass seed, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, p. 279.

Many of the seeds on plants in a screened box submerged in a salt creek in the latter part of August had germinated by October 23. The bearing of this experience on a practical method of preserving seed for planting is discussed.

Management: Stocking, quail, California

McMillan, Ian I. Establishment of artificially propagated quail, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(4), July-Aug. 1947, p. 170.

History of a successful colony that increased from 24 to 49 in a year, with notes on food and predators.

Management: Transplanting antelope

Thompson, Ken. Air-herding the pronghorn, American Forests (919 Seventeenth St., N.W., Washington 6, D. C. 50 cents a copy), 53(8), Aug. 1947, pp. 348-349, 380-381, 2 photos, 2 cartoons.

A roaring plane with screaming siren was effective in driving the animals into a funnel of woven wire. Thence ground crews urged them into a cord-netting corral. They were transferred to a specially-prepared truck and taken to the planting site, 150 miles away. Improvements in the method are described; the largest herd captured included 203 animals and this was done with less than 15 minutes of flying. About a thousand antelopes have been transplanted in Montana.

Management: Transplanting beaver

Dalke, Paul D. The beaver in Missouri, Missouri Conservationist (Missouri Conservation Commission, Jefferson City), 8(6), June 1947, pp. 1-3, 3 photos, 1 map.

Almost extirpated by 1915, beavers, through restocking in 1928 and later years, have spread and founded numerous colonies, the distribution of which in 1946 is shown on the map. Feeding habits and food caches are described.

Management: Transplanting wood ducks

McCabe, Robert A. The homing of transplanted young wood ducks, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 59(2), June 1947, pp. 104-109, 1 fig., 1 table.

Author's summary: "In August 1944, 97 young Wood Ducks, hatched and partially reared in Illinois, were raised to about seven weeks of age and released at Madison, Wisconsin, 200 miles from the hatching site. A few eintered in the area of the release. Ducks of both sexes from the release returned to Madison to breed, both in 1945 and 1946. None of the ducks of the release was found in the area of hatching. A similar release of young Wood Ducks, hatched in Illinois, was made in 1944 in Indiana. At least four females returned to Indiana to breed."

Management: Turkey

Bailey, Wayne. Data gathered in wild turkey investigation, West Virginia Conservation (Conservation Commission of West Virginia, State Capitol, Charleston. 10 cents a copy), 11(4), Aug. 1947, pp. 8-9, 23-24, 2 photos.

Brief gleanings from the findings of a Federal Aid project. Fifty-six percent of the present turkey population is in the beech-birch-maple association, not because it is the best range but because there the birds are less disturbed by man. In some areas, the kill was 70 to 80 percent, entirely too high. It should be reduced by shortening the hunting season and by establishing additional, properly dispersed refuges. In the mountain ranges to which the birds have been forced, heavy snows often reduce them to a non-sustentative diet. At such times artificial feeding is of considerable value. The turkey population is inversely proportional to that of people and man is the turkey's worst enemy. Management suggestions are made. Without improved management, turkeys sooner or later will exist only on major refuges.

Management: Turkey

Dalke, Paul D., A. Starker Leopold, and David L. Spencer. The ecology and management of the wild turkey in Missouri. Missouri Conservation Commission (Jefferson City) Tech. Bul. 1, 86 pp., frontispiece, 18 figs., 15 tables, cartoons, 1947.

Report on a Federal Aid project. After long decline, management and a close season have led to a moderate upswing in the turkey population. The native stock alone is concerned as introduced birds of mixed blood have added virtually nothing to the turkey stock of the State. Data on the number of birds in 1934-35 and in 1942 are tabulated and discussed and the range and population density in 1942 indicated on a map. Factors affecting the distribution and abundance of the birds are considered, including soils, topography and vegetation, land-use practices, and illegal kill. Under ecological relationships the authors deal with the composition, organization, and range of winter flocks, influence of logging operations, food habits (fully and in detail), breeding habits including nesting failures and brood losses, and limiting factors. "Although there is now no (open) . . . season in Missouri, man still causes a larger drain on the wild turkey population than all its natural enemies combined." Experiences with restocking are summarized; they were such as to lead to abandonment of the activity. Management topics considered are: potential productivity and characteristics of the range; land-use practices, as forest and livestock production, agriculture; re-establishment of breeding stock on unoccupied range; management of isolated colonies and State game refuges; cooperative management on private lands; and recommendations as to an open season when increase in the number of turkeys permits. Three-page bibliography. A clean-cut and well presented article.

Natural History: Amphibians and reptiles of Minnesota

Breckenridge, W. J. Reptiles and amphibians of Minnesota. University of Minnesota Press (Minneapolis. $2.50 a copy), xiii+ 202 pp., 52 figs., 45 maps, 1944.

The history of knowledge of Minnesota herpetology is sketched, popular tales about reptiles and amphibians are appraised, and the distribution of the animals in the State is discussed (small maps show the ranges of the various species in North America and in Minnesota, as well as definite localities of capture in the State). Suggestions are given as to: field methods, the care of reptiles and amphibians in captivity (this section by Milton Thompson), treatment of venomous snake bites, and preservation of specimens. A key to species and directions for its use are presented. The specific accounts (18 of Amphibia and 27 of Reptilia) include descriptions, illustrations, notes on range (also a map), habits, habitat, food, and life history. The work is well done and pleasingly presented. A glossary, bibliography, and index are added.

Natural History: Lizards of Colorado

Maslin, T. Paul. Lizards of Colorado. University of Colorado Museum (Boulder), Leaflet 3, Aug. 1947, 14 pp., 17 figs.

Illustrated key and brief descriptive and distributional accounts of 21 species and subspecies.

Natural History: Longevity

Perkins, C. B. A note on longevity of amphibians and reptiles in captivity, Copeia (M. Graham Netting, Carnegie Museum, Pittsburgh 13, Pa. $1.00 a copy), 1947(2), June 1947, p. 144.

Tabulation for about 20 species; range 10-24 years.

Natural History: Mammals

Cahalane, Victor H. Mammals of North America. Macmillan Company (60 Fifth Ave., New York, N. Y. $7.50 a copy), x+ 682 pp., 92 figs. by Francis L. Jaques, 1947.

The introduction deals with primitive abundance, reduction by man, present degree of restoration, how mammals affect humans, scope and style of the work, and the nature and history of mammals. The more than 1,500 species and subspecies occurring in America north of Mexico are treated under 94 headings that correspond variously to genera, groups of species, or species. The accounts of these units are primarily popular and the author from his considerable field experience has personal knowledge of most of them. Published information has been digested and essentials as to appearance and range are incorporated. The author has succeeded in readably summarizing knowledge of our mammals and has produced also a valuable and comprehensive reference work. There is a 30-page classified bibliography and a 6-page index.

Natural History: Mammals of Virginia

Handley, Charles O., Jr., and Clyde P. Patton. Wild mammals of Virginia. Commission of Game and Inland Fisheries (7 North Second St., Richmond 13, Va. $3.00 a copy), vi+ 220 pp., frontis.+ 103 figs.

Introductory chapters give information on mammals as a class, on the plan of the book, and on studying mammals. The book includes a popular and a technical section. In the former are treated game mammals, fur bearers, rodents, marine species, vanished (including fossil) forms, and the natural regions of Virginia. The technical section includes a check-list of wild mammals of the State, keys, and systematic accounts of the species. These cover type locality, distinguishing characteristics, measurements, general distribution, range in Virginia (mapped), and habitat. There is an 8-page bibliography and a 4-page index. A creditable work which should help very much to increase public knowledge of the mammals of Virginia.

Natural History: Pocket gopher

Goldman, Edward A. The pocket gophers (Genus Thomomys) of Arizona. U. S. Fish and Wildlife Service, North American Fauna 59 (Supt. of Documents, Washington 25, D. C. 15 cents a copy), 39 pp., 2 maps, 1947.

General characteristics and economic status are briefly treated but the bulk of the publication is made up of technical descriptions (including measurements) and statements of distribution and habitat of the 44 subspecies known from Arizona.

Natural History: Raptors of Ontario, Canada

Snyder, L. L. The hawks and owls of Ontario. Royal Ontario Museum of Zoology (Toronto), Handbook 2, revised edition, 47 pp., numerous figs., tables, graphs, 1947.

Introductory sections discuss the place and role of the birds of prey in nature, food competition and diet variation, physical characteristics and classification of the hawks and owls, and studies of the food of these birds in Ontario. The accounts of species known to have occurred in the Province include description, sketch of habits, a black and white illustration (each by T. M. Shortt), and when material permits, a graph showing proportions of food based on regional stomach analyses. An excellent publication.

Propagation: History

Nestler, Ralph B. Game bird propagation--its beginning, growth, and future, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 18(3), June 1947, pp. 10-11, 30-33, 36, 40, 13 figs.

Historical compilation including propagation in China back to 1400 B.C., in the Middle East, Europe, and America. Game bird raising in the United States is traced in somewhat greater detail from 1851, including the activities of both private individuals and state game departments. At present, propagation for restocking purposes seems to be facing a decline and in the future more attention will be paid to the restoration and improvement of habitat.

Propagation: Incubator fumigation

Moore, Earl N. The use of propylene glycol as an incubator fumigant, Journ. Amer. Veterinary Med. Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 111(845), Aug. 1947, pp. 116-121, 1 fig., 3 tables.

Comparison of the advantages and disadvantages of the use of formalin and of propylene glycol, account of experiments with the latter, and conclusions as follows: "The physical and chemical properties of propylene glycol make it a suitable product for the fumigation of incubators. Studies to date indicate, however, that it is not as effective as formalin in destroying certain bacteria, particularly staphylococci and spore-forming organisms. Additional work may prove it to be an effective chemical agent to prevent disease transmission during the hatching period when formalin must be used with extreme caution due to its toxicity to chicks a few hours after hatching. Further field work will be necessary to determine its true status as an incubator fumigant." Bibliography of 7 titles.

Research: Age determination, bird

Davis, David E. Size of bursa of Fabricius compared with ossification of skull and maturity of gonads, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 244-251, 3 tables.

Author's summary: "The bursa of Fabricius may be used to determine the age of individuals because of its large size in young birds and small size in adults. A correlation of the size of the bursa with the maturity of the gonads and with the ossification of the skull may permit a more accurate determination of the age of birds for use in game management and enzootiologic investigations. This report compares the size of the bursa, ossification of the skull, and the maturity of the gonads in a collection of about 700 Brazilian birds. The specimens are divided into 7 classes according to the order of attainment of maturity of the bursa, skull, and gonads. When the birds are grouped according to the season of collection, it is found that the percentage of adults (Class 7) is highest in the early part of the breeding season and that the highest percentage of young individuals (Classes 1 and 2) are found in the latter part of the breeding season. This method offers the possibility of a more detailed determination of the age of wild birds which for economic or practical reasons cannot be raised in captivity for the purpose of establishing characters from birds of known ages." Bibliography of 10 titles.

Research: Banding pheasants

Ginn, Wm. E. Band returns from Indiana club-reared pheasants, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 226-231, 5 tables.

Report on a Pittman-Robertson Wildlife Research Project, for which the author's summary is: "During the period between July 13 and August 28, 1942, a total of 8,406 pheasants, pen-reared by 48 conservation clubs, were banded and released at 8 weeks of age in 35 different counties in Indiana. A total of 367 band returns were received between July 17, 1942, and December 6, 1943, representing 4.4 per cent of the total release. Assuming an equal cock-hen ratio, the returns for 271 cocks represented 6.4 per cent of the total cock pheasants released. Band returns, in accordance with time released, revealed that 2,481 pheasants released during the period in July resulted in a return of 5.6 per cent, as compared with a return of 7.7 per cent for 1,722 pheasants released in August. Based on seasonal periods, return percentages were: pre-hunting season, 20.8; open hunting season, 75.4; post-hunting season, 2.5; and second year, 1.4. Distances traveled by 325 pen-reared pheasants between the points of release and recovery were as follows: 11.1 per cent recovered on release farms; 29.8 per cent at distances from $\frac{1}{4}$ to 1 mile; 28.2 per cent at distances over 1 mile to 5 miles; and 20.9 per cent over 5 miles. Causes of mortality were 73.8 per cent by hunters; 14.2 per cent by accidents; 6.3 per cent by predators; and 5.7 per cent due to miscellaneous and unknown causes."

Research: Detecting lead shot in ducks

Whitlock, S. C., and H. J. Miller. Gunshot wounds in ducks, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 279-281, 1 pl.

X-rays and fluoroscope for detecting shot in the bodies of ducks. Only a small percentage of Michigan waterfowl examined had lead in their gizzards but from 20 to 30 percent had shot scattered through their bodies, obviously as a result of gun-fire by hunters. Among more than 900 wild-trapped ducks, about 2 percent had sustained wing fractures but had recovered to fly again. Discussion of gun-pressure as a limiting factor on waterfowl.

Research: Ferreting rabbits

Linduska, J. P. The ferret as an aid to winter rabbit studies, Journ. Wildlife Management (George A. Petrides, Ohio Cooperative Wildlife Research Unit, Columbus 10. $1.00 a copy), 11(3), July 1947, pp. 252-255.

Investigations in Michigan, the methods and success of which are reported, and summarized as follows: "(1) A method involving the use of ferrets for censusing cottontails on local areas and for obtaining individuals for mid-winter examination was given trial during two years and found to have merit; (2) the procedure was found to have special utility in areas and under various conditions which complicate live-trapping as a means of obtaining certain biological information; (3) the use of brush piles and burrows by cottontails was observed to be strongly influenced by air temperatures. Consequently, the most fruitful work with ferrets was on cold days; (4) the failure to retake 'ferreted' rabbits from burrows suggested that the experience may have established some reluctance in rabbits towards the use of den cover." Bibliography of 6 titles.

Speed of flight: Kingfisher

Burland, Lee J. Air speed of belted kingfisher, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 59(2), June 1947, p. 113.

40-45 m.p.h. with an estimated 3 m.p.h. following wind. Colorado.

U. S. Government: Fish and Wildlife Service, Annual Report 1945-46

Day, Albert M. Annual Report of the Director, Fish and Wildlife Service to the Secretary of the Interior, Fiscal Year ended June 30, 1946 (U. S. Government Printing Office, Washington 25, D. C.), 1947, pp. 275-306, 6 tables.

Some relaxation in space restrictions has enabled presentation of a report more adequate than its immediate predecessors. This statement seeks to show how wildlife resources have been affected for good or ill by the war years and to suggest policies for management of wildlife during the period of reconversion to peace-time ways. With those guiding principles, the status of migratory game birds and of the national wildlife refuges is discussed; under the general heading "Conservation of Wildlife Resources," are considered: the effects of DDT on wildlife, nutritional deficiency in bobwhites, water utilization and wildlife, Federal aid to State projects for the restoration of wildlife, and the Patuxent Refuge--a laboratory for conservation; cooperative wildlife management studies in 10 states are reviewed as are also wildlife research on public lands, fur farming, control of predators and rodents, and the fur-seal resources.

U. S. Government: Fish and Wildlife Service, Pittman-Robertson Program

Anon. Annual Report of the Pittman-Robertson Program for fiscal year ending June 30, 1946. Wildlife Management Institute (Investment Bldg., Washington 5, D. C.), 20 pp., 5 tables, 1947.

This report, prepared from information furnished by the Federal Aid Division of the Fish and Wildlife Service, sets forth the status of funds for the work, and the method of apportionment, receipts and disbursements 1939-47, comments on the states participating, projects approved, their character and the personnel engaged, and forecasts probable future developments. The tables also show net obligations by types of projects 1939-46, apportionment to States and Territories, the nature of projects approved, and the funds obligated for them in the fiscal year 1946. Total apportionments for 9 years: $13,248,100.

U. S. Government: Fish and Wildlife Service, Refuges

Carson, Rachel L. Chincoteague a national wildlife refuge. U. S. Fish and Wildlife Service, Conservation in Action, No. 1, 18 pp., covers, illus. (Supt. of Documents, Washington 25, D. C. 15 cents a copy), 1947.

Popular account in relation to other refuges and to the wildfowl migration of the Atlantic Flyway. Species principally benefitted include the greater snow goose, American brant, and black duck. Notes on other anserines and shore birds that visit the Refuge, bird-banding done there, and features of special interest in the region.

U. S. Government: Fish and Wildlife Service, River Basin Development

Cottam, Clarence. Missouri River Basin development. Its effect on fish and wildlife, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 11(6), June 1947, pp. 20-27.

The economic values of wildlife and the relation of the proposed development to wildlife are considered, among them impoundment problems and possibilities. Coordinated legislation and the place of the Fish and Wildlife Service in the river development field are discussed. Conclusions: "The fish and wildlife resources of this country have definite economic values as well as esthetic and spiritual appeal. The Missouri River Basin provides fish and wildlife habitat that has national as well as local significance. The economic development of the Missouri River Basin should be based upon plans incorporating sound biological principles and measures designed to preserve and increase these major natural resources. Recent legislation will permit conservation interests to introduce into the original plans such desirable modifications in structures and their operation. The Fish and Wildlife Service, in cooperation with other Government agencies and the States concerned, is studying proposed projects for their comparative values and effect upon these resources."

Weights: Ducks

Bellrose, Frank C., and Arthur S. Hawkins. Duck weights in Illinois, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(3), July 1947, pp. 422-430, 2 figs., 9 tables.

The average weights of hundreds of specimens are tabulated and discussed in relation to sex, age, locality, and season. The effects of food and weather on weights are considered. In summary, the authors say: "We deduce, therefore, that, except in rare instances, the number of ducks present in an area is well within the carrying capacity of that area; a reduction in the available food supply, brought about by adverse weather or other conditions, results in a reduction in numbers roughly comparable to the reduction in food supply. Consequently, the ducks remaining have sufficient food to maintain their body weight. We conclude that: (1) Illinois hunters in 1938 were mistaken in their belief that ducks were in poor flesh because of a scarcity of food. (Perhaps these hunters were killing unusually large numbers of juveniles which average from 4 to 9 per cent lighter than adults.) Because of mobility, ducks undergo little change in weight with adverse food and weather conditions in a limited area; (2) Canvas-backs are the heaviest of the ducks that migrate through Illinois, followed by Mallards and Black Ducks, Pintails and Gadwalls; Green-winged Teals are the lightest; (3) very few Mallards or Black Ducks weigh over three pounds; no ducks of these species were found to weigh four or five pounds."

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

292. The Hungarian and chukar partridges in America, by John W. Aldrich, 10 pp., February 1947.

Suggestions relating to introductions; history and success of stocking ventures with the species named. The Hungarian partridge reported breeding in 23, and the chukar in 6, states. Bibliography of 22 titles. Supersedes Wildlife Leaflet BS-159, 1940.

294. Keeping up with the waterfowl, by Frederick C. Lincoln, 10 pp., 2 photos, 10 maps, April 1947.

Description of methods employed in estimating populations and problems connected with their use. The maps delineate the principal wintering and breeding ranges of the waterfowl as a whole and the flyways with their refuge systems. Reprinted from Audubon Magazine, 48(4), July-August 1946, pp. 194-205.

296. Colleges and universities offering courses in wildlife management, compiled by Gustav Swanson and Lee E. Yeager, 15 pp., 3 tables, August 1947.

Sketch of the development of education in conservation and wildlife management (37 schools now participating); suggestions on preparing for wildlife work, including: Research, administration, teaching, writing, and photography. The training courses available are outlined and tabulated according to the institutions giving them. Staffs, students, and facilities also are enumerated. The addresses of the schools are listed and employment opportunities in the wildlife field are discussed. Bibliography of 15 titles. Supersedes Wildlife Research and Management Leaflet BS-98, 1937.

NOTES AND NEWS

The Arctic Institute of North America is offering two Research Fellowships of $2000 each for scientific work in the North American Arctic and Subarctic during 1948. Research must include field investigations either in Alaska, northern Canada, Labrador, Newfoundland, or Greenland. The Fellowships are open to anyone who has demonstrated his ability to carry out research work of superior quality in some field of science. Applications must be received by November 1, 1947. Fellowships will be awarded on the recommendation of the Board of Governors of the Arctic Institute, and will be announced by March 1948. Fellowship application forms may be obtained upon application to: The Arctic Institute of North America, 805 Sherbrooke Street West, Montreal, Canada.

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